

CLAIMS

1. Apparatus for use with a subject, comprising:
a memory, storing a set of computer instructions,
5 wherein the memory is adapted to have stored therein an initial form of a multi-phase biorhythmic activity pattern and an indication of a desired form of the multi-phase biorhythmic activity pattern,
wherein a ratio of durations of two phases in the desired form is different from a ratio of durations of the respective phases in the initial form, and
10 wherein at least one phase of the multi-phase biorhythmic activity pattern corresponds to a respective phase of a multi-phase biorhythmic activity of the subject; and
a stimulus unit, adapted to execute the stored instructions and to generate responsive thereto a time-varying stimulus that: (a) is substantially not responsive to
15 ongoing measurement of the multi-phase biorhythmic activity during generation of the time-varying stimulus, and (b) has a multi-phase pattern that is characterized by a series of transitional forms intermediate the initial form and the desired form that guide the subject to modify the biorhythmic activity.
2. The apparatus according to claim 1, wherein the stimulus unit is adapted to
20 generate the time-varying stimulus having the multi-phase pattern, wherein durations of the transitional forms in the series vary linearly over time.
3. The apparatus according to claim 1, wherein the stimulus unit is adapted to generate the time-varying stimulus having the multi-phase pattern, wherein durations of the transitional forms in the series vary geometrically over time.
- 25 4. The apparatus according to claim 1, wherein the initial form has a first number of phases and the desired form has a second number of phases, the first number not equal to the second number, and wherein the memory is adapted to have stored therein the initial form and the indication of the desired form having the differing numbers of phases.
- 30 5. The apparatus according to claim 1, wherein the initial form has a greater number of phases than the desired form, and wherein the memory is adapted to represent a phase that is in the initial form but not in the desired form by setting a duration thereof equal to zero in the desired form.

6. The apparatus according to claim 1, wherein the desired form has a greater number of phases than the initial form, and wherein the memory is adapted to represent a phase that is in the desired form but is not in the initial form by setting a duration thereof equal to zero in the initial form.

5 7. The apparatus according to claim 1, wherein the initial form and the desired form have the same number of phases, and wherein the memory is adapted to have stored therein the initial form and the indication of the desired form having the same number of phases.

10 8. The apparatus according to claim 1, wherein the memory is adapted to have stored therein the initial form and the indication of the desired form prior to use of the apparatus with the subject.

15 9. The apparatus according to claim 1, wherein the time-varying stimulus comprises at least one stimulus selected from the list consisting of: an image, alpha-numeric text, a sound, a sound pattern, a dynamic graphical pattern, and a visual cue, and wherein the stimulus unit comprises a visual stimulator, adapted to generate the selected time-varying stimulus.

10. The apparatus according to claim 1, wherein the time-varying stimulus comprises pressure, and wherein the stimulus unit comprises a pressure applicator, adapted to apply the pressure to a portion of a body of the subject.

20 11. The apparatus according to claim 1, wherein the time-varying stimulus comprises massage, and wherein the stimulus unit comprises a massaging device, adapted to massage a portion of a body of the subject.

25 12. The apparatus according to claim 1, wherein the time-varying stimulus comprises mechanical energy, and wherein the stimulus unit comprises a mechanical stimulator, adapted to apply the mechanical energy to a portion of a body of the subject.

13. The apparatus according to claim 1, wherein the time-varying stimulus comprises an electrical current, and wherein the stimulus unit comprises an electrical stimulator, adapted to apply the current to a portion of a body of the subject.

30 14. The apparatus according to claim 1, wherein the time-varying stimulus is in the form of a game, and wherein the stimulus unit comprises a game generator, adapted to

alter parameters of the game so as to guide the subject to modify the multi-phase biorhythmic activity.

15. The apparatus according to claim 1, wherein the stimulus unit is adapted to transmit the time-varying stimulus over a telephone network to the subject.

5 16. The apparatus according to claim 1, wherein the stimulus unit is adapted to transmit the time-varying stimulus over a wide-area network to the subject.

17. The apparatus according to claim 1, comprising a muscle stimulator, adapted to operate in conjunction with the stimulus unit and to apply to a muscle of the subject an electrical current configured to stimulate the muscle.

10 18. The apparatus according to claim 1, wherein the stimulus unit is adapted to configure the time-varying stimulus to increase tissue oxygenation of the subject.

19. The apparatus according to claim 1, wherein the stimulus unit is adapted to configure the time-varying stimulus to increase mechanical compliance of blood vessels of the subject.

15 20. The apparatus according to claim 1, wherein the stimulus unit is adapted to configure the time-varying stimulus to reduce peripheral impedance of small blood vessels of the subject.

21. The apparatus according to claim 1, wherein the stimulus unit is adapted to configure the time-varying stimulus to increase heart rate variability of the subject.

20 22. The apparatus according to claim 1, wherein the stimulus unit is adapted to configure the time-varying stimulus to increase baroreflex sensitivity of the subject.

23. The apparatus according to claim 1, comprising a motion stimulator, adapted to operate in conjunction with the stimulus unit and to generate a motion stimulus that guides the subject to perform movements of a limb of a body of the subject.

25 24. The apparatus according to claim 1, wherein the stimulus unit is adapted to generate the time-varying stimulus when the subject is sleeping.

25. The apparatus according to claim 1, wherein the stimulus unit is adapted to generate the time-varying stimulus when the subject is mechanically ventilated.

30 26. The apparatus according to any one of claims 1-25, wherein the time-varying stimulus comprises music.

27. The apparatus according to claim 26, wherein the stimulus unit comprises a music synthesizer, adapted to generate the music.

28. The apparatus according to any one of claims 1-25, wherein the stimulus unit is adapted to generate a time-varying stimulus that is substantially not responsive to ongoing measurement of a physiological variable of the subject during generation of the time-varying stimulus.

29. The apparatus according to claim 28, wherein the stimulus unit is adapted to generate a time-varying stimulus that is not responsive to a measurement of a physiological variable of the subject during use of the apparatus with the subject.

30. The apparatus according to any one of claims 1-25, comprising a sensor, adapted to sense a physiological event and to generate an event signal responsive thereto,

wherein the apparatus is adapted to receive the event signal prior to generation of the time-varying stimulus by the stimulus unit, and

wherein the stimulus unit is adapted to commence generating the time-varying stimulus responsive to the event signal.

31. The apparatus according to claim 30, wherein the apparatus is adapted to configure the initial form at least in part responsively to a parameter of the event signal.

32. The apparatus according to claim 30, wherein the physiological event includes an episode of sleep apnea, and wherein the sensor is adapted to sense the episode of sleep apnea.

33. The apparatus according to any one of claims 1-25, wherein the memory is adapted to have stored therein a plurality of exercise routines having respective initial forms and respective indications of desired forms,

wherein the stimulus unit comprises a user interface, adapted to enable the subject to select one of the exercise routines, and

wherein the stimulus unit is adapted to generate the time-varying stimulus responsive to the selection.

34. The apparatus according to claim 33, wherein the user interface comprises a telephone.

35. The apparatus according to claim 33, wherein the user interface comprises a user interface of an audio-playback device.

36. The apparatus according to claim 33, wherein the user interface comprises a user interface of a general-purpose computer.

37. The apparatus according to any one of claims 1-25, wherein the stimulus unit is adapted to generate the time-varying stimulus when the subject is unconscious.

5 38. The apparatus according to claim 37, wherein the stimulus unit is adapted to generate the time-varying stimulus when the subject is in a coma.

39. The apparatus according to claim 37, wherein the stimulus unit is adapted to generate the time-varying stimulus when the subject is anesthetized.

10 40. The apparatus according to any one of claims 1-25, wherein the multi-phase biorhythmic activity includes respiration of the subject, and wherein the stimulus unit is adapted to configure the time-varying stimulus to guide the subject to modify the respiration.

15 41. The apparatus according to claim 40, wherein the multi-phase biorhythmic activity of the subject is characterized by a rate of breathing, and wherein the memory is adapted to have stored therein the initial form and the indication of the desired form, wherein a rate of breathing in the desired form is different from a rate of breathing in the initial form.

20 42. The apparatus according to claim 40, wherein two or more phases in the desired form include at least one respiration phase not generally included in the multi-phase biorhythmic activity prior to generating the time-varying stimulus, and wherein the memory is adapted to have stored therein an indication of the at least one respiration phase.

25 43. The apparatus according to claim 40, wherein two or more phases in the desired form include at least one respiration phase selected from the list consisting of: breath holding and post-expiratory pausing, and wherein the memory is adapted to have stored therein an indication of the selected respiration phase.

44. The apparatus according to claim 40, comprising a resistive load, adapted to be applied to the subject and to resist airflow of the subject during a phase of respiration selected from inspiration and expiration.

30 45. The apparatus according to claim 40, comprising a mechanical ventilator, adapted to be applied to the subject and to operate in conjunction with the stimulus unit.

46. The apparatus according to claim 40, wherein two or more phases in the initial and the desired forms include inspiration and expiration, and wherein the memory is adapted to have stored therein the initial form and the indication, wherein a ratio of a duration of the inspiration to a duration of the expiration (an I:E ratio) in the desired form is less than
5 an I:E ratio in the initial form.

47. The apparatus according to claim 46, wherein the memory is adapted to have stored therein the initial form and the indication, wherein the I:E ratio in the desired form is between about 1:0.5 and 1:4.

10 48. The apparatus according to any one of claims 1-25, comprising a user interface, adapted to receive input from the subject, wherein the apparatus is adapted to store the initial form and the indication of the desired form in the memory, responsive to the input.

49. The apparatus according to claim 48, wherein the user interface is adapted to receive an indication of durations of two or more phases in the indication of the desired form.

15 50. The apparatus according to claim 48, wherein the user interface is adapted to receive indications of trends over time of respective durations of two or more phases in the initial form.

51. The apparatus according to claim 48, wherein the user interface is adapted to receive an indication of durations of two or more phases in the initial form.

20 52. The apparatus according to claim 48, wherein the user interface is adapted to receive an indication of durations of two or more phases in the desired form.

53. The apparatus according to claim 48, wherein the user interface is adapted to measure a lapse between a start indication and an end indication of at least one of the phases in the indication of the initial form.

25 54. The apparatus according to claim 53, wherein the start and end indications include respective audible indications of respiration of the subject, and wherein the user interface is adapted to sense the audible start and end indications.

30 55. The apparatus according to claim 53, wherein the user interface is adapted to receive the start and end indications from the subject at respective times, and to measure the lapse responsive thereto.

56. A method for use with a subject, comprising:

storing an initial form of a multi-phase biorhythmic activity pattern and an indication of a desired form of the multi-phase biorhythmic activity pattern,

wherein a ratio of durations of two phases in the desired form is different from a ratio of durations of the respective phases in the initial form, and

wherein at least one phase of the multi-phase biorhythmic activity pattern corresponds to a respective phase of a multi-phase biorhythmic activity of the subject; and

generating a time-varying stimulus that: (a) is substantially not responsive to ongoing measurement of the multi-phase biorhythmic activity during generation of the time-varying stimulus, and (b) has a multi-phase pattern that is characterized by a series of transitional forms intermediate the initial form and the desired form that guide the subject to modify the multi-phase biorhythmic activity.

57. The method according to claim 56, wherein generating the time-varying stimulus comprises generating the time-varying stimulus having the multi-phase pattern, wherein durations of the transitional forms in the series vary linearly over time.

58. The method according to claim 56, wherein generating the time-varying stimulus comprises generating the time-varying stimulus having the multi-phase pattern, wherein durations of the transitional forms in the series vary geometrically over time.

59. The method according to claim 56, wherein the initial form has a first number of phases and the desired form has a second number of phases, the first number not equal to the second number, and wherein storing the initial form and the indication of the desired form comprises storing the initial form and the indication of the desired form having the differing numbers of phases.

60. The method according to claim 56, wherein the initial form has a greater number of phases than the desired form, and wherein storing the indication of the desired form comprises representing a phase that is in the initial form but is not in the desired form by setting a duration thereof equal to zero in the desired form.

61. The method according to claim 56, wherein the desired form has a greater number of phases than the initial form, and wherein storing the initial form comprises representing

a phase that is in the desired form but is not in the initial form by setting a duration thereof equal to zero in the initial form.

62. The method according to claim 56, wherein the initial form and the desired form have the same number of phases, and wherein storing the initial form and the indication of the desired form comprises storing the initial form and the indication of the desired form having the same number of phases.
63. The method according to claim 56, wherein storing the initial form and the indication of the desired form comprises storing the initial form and the indication of the desired form prior to use of the method with the subject.
64. The method according to claim 56, wherein the time-varying stimulus includes music, and wherein generating the time-varying stimulus comprises generating the music.
65. The method according to claim 56, wherein the time-varying stimulus includes at least one stimulus selected from the list consisting of: an image, alpha-numeric text, a sound, a sound pattern, a dynamic graphical pattern, and a visual cue, and wherein generating the time-varying stimulus comprises generating the selected stimulus.
66. The method according to claim 56, wherein the time-varying stimulus includes pressure, and wherein generating the time-varying stimulus comprises applying the pressure to a portion of a body of the subject.
67. The method according to claim 56, wherein generating the time-varying stimulus comprises massaging a portion of a body of the subject with a massaging device.
68. The method according to claim 56, wherein generating the time-varying stimulus comprises applying mechanical energy to a portion of a body of the subject.
69. The method according to claim 56, wherein generating the time-varying stimulus comprises applying an electrical current to a portion of a body of the subject.
70. The method according to claim 56, wherein generating the time-varying stimulus comprises generating the time-varying stimulus in the form of a game, and altering parameters of the game so as to guide the subject to modify the multi-phase biorhythmic activity.
71. The method according to claim 56, wherein generating the time-varying stimulus comprises transmitting the time-varying stimulus over a telephone network to the subject.

72. The method according to claim 56, wherein generating the time-varying stimulus comprises transmitting the time-varying stimulus over a wide-area network to the subject.

73. The method according to claim 56, comprising, in conjunction with generating the time-varying stimulus, applying to a muscle of the subject an electrical current configured to stimulate the muscle.

74. The method according to claim 56, wherein generating the time-varying stimulus comprises configuring the time-varying stimulus to increase tissue oxygenation of the subject.

75. The method according to claim 56, wherein generating the time-varying stimulus comprises configuring the time-varying stimulus to increase mechanical compliance of blood vessels of the subject.

76. The method according to claim 56, wherein generating the time-varying stimulus comprises configuring the time-varying stimulus to reduce peripheral impedance of small blood vessels of the subject.

77. The method according to claim 56, wherein generating the time-varying stimulus comprises configuring the time-varying stimulus to increase heart rate variability of the subject.

78. The method according to claim 56, wherein generating the time-varying stimulus comprises configuring the time-varying stimulus to increase baroreflex sensitivity of the subject.

79. The method according to claim 56, comprising, in conjunction with generating the time-varying stimulus, generating a motion stimulus that guides the subject to perform movements of a limb of a body of the subject.

80. The method according to claim 56, wherein generating the time-varying stimulus comprises generating the time-varying stimulus when the subject is sleeping.

81. The method according to claim 56, wherein generating the time-varying stimulus comprises generating the time-varying stimulus when the subject is mechanically ventilated.

82. The method according to any one of claims 56-81, wherein generating the time-varying stimulus comprises generating a time-varying stimulus that is substantially not

responsive to ongoing measurement of a physiological variable of the subject during generation of the time-varying stimulus.

83. The method according to claim 82, wherein generating the time-varying stimulus comprises generating a time-varying stimulus that is not responsive to a measurement of a physiological variable of the subject during use of the method with the subject.

84. The method according to any one of claims 56-81, comprising sensing, prior to generating the time-varying stimulus, a physiological event, wherein generating the time-varying stimulus comprises commencing generating the time-varying stimulus responsive to the sensing of the physiological event.

85. The method according to claim 84, wherein storing the initial form comprises configuring the initial form at least in part responsively to a parameter of the physiological event.

86. The method according to claim 84, wherein the physiological event includes an episode of sleep apnea, and wherein sensing comprises sensing the episode of sleep apnea.

87. The method according to any one of claims 56-81, wherein storing comprises storing a plurality of exercise routines having respective initial forms and respective indications of desired forms, and wherein generating the time-varying stimulus comprises selecting one of the exercise routines.

88. The method according to claim 87, wherein selecting the one of the exercise routines comprises using a telephone to select the one of the exercise routines.

89. The method according to claim 87, wherein selecting the one of the exercise routines comprises using a user interface of an audio-playback device to select the one of the exercise routines.

90. The method according to claim 87, wherein selecting the one of the exercise routines comprises using a user interface of a general-purpose computer to select the one of the exercise routines.

91. The method according to any one of claims 56-81, wherein generating the time-varying stimulus comprises generating the time-varying stimulus when the subject is unconscious.

92. The method according to claim 91, wherein generating the time-varying stimulus comprises generating the time-varying stimulus when the subject is in a coma.

93. The method according to claim 91, wherein generating the time-varying stimulus comprises generating the time-varying stimulus when the subject is anesthetized.

5 94. The method according to any one of claims 56-81, wherein the multi-phase biorhythmic activity includes respiration of the subject, and wherein generating the time-varying stimulus comprises configuring the time-varying stimulus to guide the subject to modify the respiration.

10 95. The method according to claim 94, wherein the multi-phase biorhythmic activity of the subject is characterized by a rate of breathing, and wherein storing comprises storing the initial form and the indication of the desired form, wherein a rate of breathing in the desired form is different from a rate of breathing in the initial form.

15 96. The method according to claim 94, wherein two or more phases in the desired form include at least one respiration phase not generally included in the multi-phase biorhythmic activity prior to generating the time-varying stimulus, and wherein storing comprises storing an indication of the at least one respiration phase.

20 97. The method according to claim 94, wherein two or more phases in the desired form include at least one respiration phase selected from the list consisting of: breath holding and post-expiratory pausing, and wherein storing comprises storing an indication of the selected respiration phase.

98. The method according to claim 94, comprising applying a resistive load to the subject that resists airflow of the subject during a phase of respiration selected from inspiration and expiration.

25 99. The method according to claim 94, comprising mechanically ventilating the subject in conjunction with generating the time-varying stimulus.

30 100. The method according to claim 94, wherein two or more phases in the initial and the desired forms include inspiration and expiration, and wherein storing comprises storing the initial form and the indication, wherein a ratio of a duration of the inspiration to a duration of the expiration (an I:E ratio) in the desired form is less than an I:E ratio in the initial form.

101. The method according to claim 100, wherein storing comprises storing the initial form and the indication, wherein the I:E ratio in the desired form is between about 1:0.5 and 1:4.

102. The method according to any one of claims 56-81, wherein storing the initial form and the indication of the desired form comprises receiving an input from the subject.

103. The method according to claim 102, wherein receiving the input comprises receiving an indication of durations of two or more phases in the indication of the desired form.

104. The method according to claim 102, wherein receiving the input comprises receiving indications of trends over time of respective durations of two or more phases in the initial form.

105. The method according to claim 102, wherein receiving the input comprises receiving an indication of durations of two or more phases in the initial form.

106. The method according to claim 102, wherein receiving the input comprises receiving an indication of durations of two or more phases in the desired form.

107. The method according to claim 102, wherein receiving the input comprises measuring a lapse between a start indication and an end indication of at least one of the phases in the indication of the initial form.

108. The method according to claim 107, wherein the start and end indications include respective audible indications of respiration of the subject, and wherein measuring the lapse comprises sensing the audible start and end indications.

109. The method according to claim 107, comprising receiving the start and end indications from the subject at respective times, wherein measuring the lapse comprises measuring the lapse responsive thereto.

110. A computer software product comprising a computer-readable medium, in which program instructions are stored, which instructions, when read by a computer, cause the computer to generate a time-varying stimulus that: (a) is substantially not responsive to ongoing measurement of a multi-phase biorhythmic activity of a subject during generation of the time-varying stimulus, and (b) has a multi-phase pattern that is characterized by a series of transitional forms intermediate an initial form of a multi-phase biorhythmic

activity pattern and an indication of a desired form of the multi-phase biorhythmic activity pattern that guide the subject to modify the multi-phase biorhythmic activity,

wherein at least one phase of the multi-phase biorhythmic activity pattern of the time-varying stimulus corresponds to a respective phase of the multi-phase biorhythmic activity, and

wherein a ratio of durations of two phases in the desired form is different from a ratio of durations of the respective phases in the initial form.

111. The product according to claim 110, wherein the instructions cause the computer to generate the time-varying stimulus having the multi-phase pattern, wherein durations of the transitional forms in the series vary linearly over time.

112. The product according to claim 110, wherein the instructions cause the computer to generate the time-varying stimulus having the multi-phase pattern, wherein durations of the transitional forms in the series vary geometrically over time.

113. The product according to claim 110, wherein the initial form has a first number of phases and the desired form has a second number of phases, the first number not equal to the second number.

114. The product according to claim 110, wherein the initial form has a greater number of phases than the desired form, and wherein the instructions cause the computer to represent a phase that is in the initial form but is not in the desired form by setting a duration thereof equal to zero in the desired form.

115. The product according to claim 110, wherein the desired form has a greater number of phases than the initial form, and wherein the instructions cause the computer to represent a phase that is in the desired form but is not in the initial form by setting a duration thereof equal to zero in the initial form.

116. The product according to claim 110, wherein the initial form and the desired form have the same number of phases.

117. The product according to claim 110, wherein the computer-readable medium is adapted to have stored therein the initial form and the indication of the desired form prior to use of the product with the subject.

118. The product according to claim 110, wherein the time-varying stimulus comprises music, and wherein the instructions cause the computer to generate the music.

119. The product according to claim 110, wherein the time-varying stimulus comprises at least one stimulus selected from the list consisting of: an image, alpha-numeric text, a sound, a sound pattern, a dynamic graphical pattern, and a visual cue, and wherein the instructions cause the computer to generate the selected time-varying stimulus.

5 120. The product according to claim 110, wherein the time-varying stimulus comprises pressure, and wherein the instructions cause the computer to drive a pressure applicator to apply the pressure to a portion of a body of the subject.

121. The product according to claim 110, wherein the time-varying stimulus comprises massage, and wherein the instructions cause the computer to drive a massaging device to
10 massage a portion of a body of the subject.

122. The product according to claim 110, wherein the time-varying stimulus comprises mechanical energy, and wherein the instructions cause the computer to drive a mechanical stimulator to apply the mechanical energy to a portion of a body of the subject.

123. The product according to claim 110, wherein the time-varying stimulus comprises
15 an electrical current, and wherein the instructions cause the computer to drive an electrical stimulator to apply the current to a portion of a body of the subject.

124. The product according to claim 110, wherein the time-varying stimulus is in the form of a game, and wherein the instructions cause the computer to generate the game, and to alter parameters of the game so as to guide the subject to modify the multi-phase
20 biorhythmic activity.

125. The product according to claim 110, wherein the instructions cause the computer to transmit the time-varying stimulus over a telephone network to the subject.

126. The product according to claim 110, wherein the instructions cause the computer to transmit the time-varying stimulus over a wide-area network to the subject.

25 127. The product according to claim 110, wherein the instructions cause the computer, in conjunction with generating the time-varying stimulus, to drive a muscle stimulator to apply to a muscle of the subject an electrical current configured to stimulate the muscle.

128. The product according to claim 110, wherein the instructions cause the computer to configure the time-varying stimulus to increase tissue oxygenation of the subject.

129. The product according to claim 110, wherein the instructions cause the computer to configure the time-varying stimulus to increase mechanical compliance of blood vessels of the subject.

130. The product according to claim 110, wherein the instructions cause the computer to configure the time-varying stimulus to reduce peripheral impedance of small blood vessels of the subject.

131. The product according to claim 110, wherein the instructions cause the computer to configure the time-varying stimulus to increase heart rate variability of the subject.

132. The product according to claim 110, wherein the instructions cause the computer to configure the time-varying stimulus to increase baroreflex sensitivity of the subject.

133. The product according to claim 110, wherein the instructions cause the computer, in conjunction with generating the time-varying stimulus, to drive a motion stimulator to generate a motion stimulus that guides the subject to perform movements of a limb of a body of the subject.

134. The product according to claim 110, wherein the instructions cause the computer to generate the time-varying stimulus when the subject is sleeping.

135. The product according to claim 110, wherein the instructions cause the computer to generate the time-varying stimulus when the subject is mechanically ventilated.

136. The product according to any one of claims 110-135, wherein the instructions cause the computer to generate a time-varying stimulus that is substantially not responsive to ongoing measurement of a physiological variable of the subject during generation of the time-varying stimulus.

137. The product according to claim 136, wherein the instructions cause the computer to generate a time-varying stimulus that is not responsive to a measurement of a physiological variable of the subject during use of the product with the subject.

138. The product according to any one of claims 110-135, wherein the instructions cause the computer to:

receive an event signal, prior to generating the time-varying stimulus, from a sensor adapted to sense a physiological event and to generate the event signal responsive thereto, and

commence generating the time-varying stimulus responsive to the event signal.

139. The product according to claim 138, wherein the instructions cause the computer to configure the initial form at least in part responsive to a parameter of the event signal.

140. The product according to claim 138, wherein the physiological event includes an episode of sleep apnea, and wherein the sensor is adapted to sense the episode of sleep apnea.

141. The product according to any one of claims 110-135, wherein the computer-readable medium is adapted to have stored therein a plurality of exercise routines having respective initial forms and respective indications of desired forms,

wherein the computer has a user interface, and wherein the instructions cause the computer to (a) receive, via the user interface, a selection by the subject of one of the exercise routines, and (b) generate the time-varying stimulus responsive to the selection.

142. The product according to claim 141, wherein the user interface includes a telephone, and wherein the instructions cause the computer to receive, via the telephone, the selection.

143. The product according to any one of claims 110-135, wherein the instructions cause the computer to generate the time-varying stimulus when the subject is unconscious.

144. The product according to claim 143, wherein the instructions cause the computer to generate the time-varying stimulus when the subject is in a coma.

145. The product according to claim 143, wherein the instructions cause the computer to generate the time-varying stimulus when the subject is anesthetized.

146. The product according to any one of claims 110-135, wherein the multi-phase biorhythmic activity includes respiration of the subject, and wherein the instructions cause the computer to configure the time-varying stimulus to guide the subject to modify the respiration.

147. The product according to claim 146, wherein the multi-phase biorhythmic activity of the subject is characterized by a rate of breathing, and wherein the instructions cause the computer to generate the time-varying stimulus, wherein a rate of breathing in the desired form is different from a rate of breathing in the initial form.

148. The product according to claim 146, wherein two or more phases in the desired form include at least one respiration phase not generally included in the multi-phase biorhythmic activity prior to generating the time-varying stimulus, and wherein the instructions cause the computer to generate the time-varying stimulus having an indication of the at least one respiration phase.

149. The product according to claim 146, wherein two or more phases in the desired form include at least one respiration phase selected from the list consisting of: breath holding and post-expiratory pausing, and wherein the instructions cause the computer to generate the time-varying stimulus having an indication of the selected respiration phase.

150. The product according to claim 146, wherein the instructions cause the computer to cause a resistive load to be applied to the subject, which resists airflow of the subject during a phase of respiration selected from inspiration and expiration.

151. The product according to claim 146, wherein the instructions cause the computer to drive a mechanical ventilator to apply mechanical ventilation to the subject, in conjunction with generating the time-varying stimulus.

152. The product according to claim 146, wherein two or more phases in the initial and the desired forms include inspiration and expiration, and wherein the instructions cause the computer to generate the time-varying stimulus, wherein a ratio of a duration of the inspiration to a duration of the expiration (an I:E ratio) in the desired form is less than an I:E ratio in the initial form.

153. The product according to claim 152, wherein the instructions cause the computer to generate the time-varying stimulus, wherein the I:E ratio in the desired form is between about 1:0.5 and 1:4.

154. The product according to any one of claims 110-135, wherein the computer has a user interface, and wherein the instructions cause the computer to receive input from the subject, via the user interface, and to store the initial form and the indication of the desired form, responsive to the input.

155. The product according to claim 154, wherein the instructions cause the computer to receive, via the user interface, an indication of durations of two or more phases in the indication of the desired form.

156. The product according to claim 154, wherein the instructions cause the computer to receive, via the user interface, indications of trends over time of respective durations of two or more phases in the initial form.

5 157. The product according to claim 154, wherein the instructions cause the computer to receive, via the user interface, an indication of durations of two or more phases in the initial form.

158. The product according to claim 154, wherein the instructions cause the computer to receive, via the user interface, an indication of durations of two or more phases in the desired form.

10 159. The product according to claim 154, wherein the instructions cause the computer to measure a lapse between a start indication and an end indication of at least one of the phases in the indication of the initial form.

15 160. The product according to claim 159, wherein the start and end indications include respective audible indications of respiration of the subject, and wherein the instructions cause the computer to detect, via the user interface, the audible start and end indications.

161. The product according to claim 159, wherein the instructions cause the computer to receive, via the user interface, the start and end indications from the subject at respective times, and to measure the lapse responsive thereto.

20 162. A data storage medium comprising an arrangement of data corresponding to an output stimulus for guiding a subject to modify a multi-phase biorhythmic activity of the subject, the stimulus comprising a time-varying multi-phase pattern that is characterized by a series of transitional forms, intermediate an initial form of a multi-phase biorhythmic activity pattern and a desired form of the multi-phase biorhythmic activity pattern,

25 wherein at least one phase of the time-varying multi-phase pattern corresponds to a respective phase of the multi-phase biorhythmic activity, and

wherein a ratio of durations of two phases in the desired form is different from a ratio of durations of the respective phases in the initial form.

163. The data storage medium of claim 162, wherein the output stimulus comprises music.

164. The data storage medium of claim 162, wherein the output stimulus comprises at least one stimulus selected from the list consisting of: an image, alpha-numeric text, a sound, a sound pattern, a dynamic graphical pattern, and a visual cue.

5 165. The data storage medium of claim 162, wherein the output stimulus comprises pressure for application to a portion of a body of the subject.

166. The data storage medium of claim 162, wherein the output stimulus comprises massage for application to a portion of a body of the subject.

167. The data storage medium of claim 162, wherein the output stimulus comprises mechanical energy for application to a portion of a body of the subject.

10 168. The data storage medium of claim 162, wherein the output stimulus comprises electrical energy for application to a portion of a body of the subject.

169. Apparatus for use with a subject, comprising:

15 a data storage medium comprising a plurality of arrangements of data, each arrangement corresponding to an output stimulus for guiding the subject to modify a multi-phase biorhythmic activity of the subject, the stimulus comprising a time-varying multi-phase pattern that is characterized by a series of transitional forms, intermediate an initial form of a multi-phase biorhythmic activity pattern and a desired form of the multi-phase biorhythmic activity pattern,

20 wherein at least one phase of the time-varying multi-phase pattern corresponds to a respective phase of the multi-phase biorhythmic activity, and

wherein a ratio of durations of two phases in the desired form is different from a ratio of durations of the respective phases in the initial form; and

25 a stimulus unit, adapted to generate the output stimulus corresponding to a selected arrangement.